

## CHILD SLEEPING ASSEMBLY WITH INCLINABLE SLEEPING SURFACE

### FIELD OF THE INVENTION

**[0001]** This invention relates to a child sleeping assembly. More specifically, this invention relates to a child sleeping assembly with an inclinable sleeping surface to provide comfort to a sleeping child.

### BACKGROUND OF THE INVENTION

**[0002]** Child sleeping assemblies, such as cribs, bassinets, and playards, provide a safe environment in which a child can rest. Typically, the child sleeping assembly has a flat floorboard with a mattress positioned on top. Younger children generally are positioned by a caregiver on the mattress in a supine position to sleep; older children may roll to their stomach.

**[0003]** An uncomfortable child, such as one having difficulty breathing, may rest only fitfully if lying flat on his back or on his stomach. To help the child breathe easier, the caregiver can elevate one end of the mattress to raise the child's head and abdomen relative to his feet in a more comfortable sleeping position. The caregiver may elevate the end of the mattress by propping towels or wedges between the mattress and the frame of the sleeping assembly. Manipulating the mattress to a properly elevated position, however, can be cumbersome and time-consuming.

**[0004]** Thus, there is a need in the art for an improved child sleeping assembly to provide a more comfortable sleeping environment.

## SUMMARY OF THE INVENTION

**[0005]** According to one aspect of the invention, a child sleeping assembly comprises a floorboard, an adjustable panel movably connected to the floorboard to move between a reclined position and an inclined position, a frame mounted to the floorboard, and a fabric enclosure mounted to the frame. The fabric enclosure has a sidewall that defines an enclosed child sleeping area. The sidewall encircles the child sleeping area.

**[0006]** According to another aspect of the invention, a child sleeping apparatus comprises a floorboard; an adjustable panel movably connected to the floorboard to move between a reclined position and an inclined position, the panel including at least one adjustment track; and an adjustment element connected to the floorboard and configured to travel in the at least one adjustment track to control positioning of the panel between the reclined position and the inclined position.

**[0007]** It is to be understood that both the foregoing general description and the following detailed description are exemplary and explanatory only and are not restrictive of the invention, as claimed.

## BRIEF DESCRIPTION OF THE DRAWINGS

**[0008]** The accompanying drawings, which are incorporated in and constitute a part of this specification, illustrate several embodiments of the invention and, together with the description, serve to explain the principles of the invention.

**[0009]** FIG. 1A is a top perspective view of a bassinet in which the bassinet floor and mattress are raised to an inclined position in accordance with the invention.

**[0010]** FIG. 1B is a top perspective view of the bassinet of FIG. 1A in which the bassinet floor and mattress are in a reclined position.

**[0011]** FIG. 1C is a top perspective view of the bassinet of FIG. 1B with the mattress pad removed.

**[0012]** FIG. 2 is a top perspective view of the floorboard, adjustable panel, and frame of the bassinet.

**[0013]** FIG. 2A is a top perspective view of the floorboard, adjustable panel, and frame of the bassinet, showing removal of a rail from the bassinet frame.

**[0014]** FIG. 2B is an enlarged view, in cross section, of the hinged connection between the floorboard and the adjustable panel.

**[0015]** FIG. 3 is a top plan view of the floorboard and the adjustable panel.

**[0016]** FIG. 4 is a bottom plan view of the floorboard and the adjustable panel.

**[0017]** FIG. 5A is a bottom perspective view of the floorboard, the adjustable panel, and the adjustment mechanism that enables adjustment of the panel between the reclined position and the inclined position.

**[0018]** FIG. 5B is another bottom perspective view of the floorboard, the adjustable panel, and the adjustment mechanism.

**[0019]** FIGS. 6A-6C are side elevation views of the floorboard, the adjustable panel, and the adjustment mechanism that show the panel positioned at various angles relative to the floorboard.

#### **DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS**

**[0020]** Reference will now be made in detail to presently preferred embodiments of the invention, examples of which are illustrated in the accompanying drawings. An effort has been made to use the same reference numbers throughout the drawings to refer to the same or like parts.

**[0021]** FIGS. 1A and 1B illustrate a bassinet 100 that includes an adjustable panel movably connected to the bassinet floorboard so that the head, shoulders, and abdominal area of a child sleeping in the bassinet can be raised relative to the child's feet, as will be described in more detail below. FIG. 1A shows a child lying in the bassinet 100 with the adjustable panel positioned in an inclined position. In this position, the panel serves to elevate the mattress in the area of the child's head and abdomen. Elevating the child's head, shoulders, and abdomen can help an uncomfortable child, for example, one having difficulty breathing, to breathe easier. FIG. 1B shows a child lying in the bassinet 100 with the adjustable panel positioned in a reclined position. In the reclined position, the panel lies flush with the bassinet floorboard, creating a flat surface, and the child can lie in a supine position, as shown in FIG. 1B, or on his/her stomach on the mattress.

**[0022]** The bassinet 100 includes a fabric enclosure 110. The fabric enclosure 110 has a sidewall 112 that defines an enclosed child sleeping area 116. The sidewall 112 encircles the child sleeping area; that is, the sidewall 112 passes completely around the child sleeping area, though not necessarily in a circle. In the illustrated embodiment, the enclosure 110 also can include a floor 114, and a mattress 118 can be positioned above the floor 114, as can be seen by comparing FIGS. 1A and 1C. FIG. 1C shows the fabric enclosure 110 with the mattress 118 removed, exposing the floor 114. The mattress 118 can be soft, padded, and flexible to provide a comfortable sleeping surface. In an alternative embodiment, the mattress 118 can be built into the floor 114, for example, by sandwiching soft, padded mattress material between top and bottom layers of floor material.

**[0023]** The fabric enclosure 110 can include a ventilation panel 120, as described in co-pending application Serial No. \_\_\_\_\_, filed March 25, 2004 in the name of Jon DeHart et al. and entitled CHILD CONTAINMENT STRUCTURE WITH VENTILATION PANEL, which is incorporated by reference herein in its entirety. The ventilation panel 120 is incorporated into

the sidewall 112 of the bassinet 100, strategically located between the floor 114 and a side panel 122 of the sidewall 112, so that adequate air flow occurs between an interior of the bassinet 100 and an exterior of the bassinet 100 along the surface of the floor 114 and, if present, the mattress 118. As can be seen best in FIG. 1C, the ventilation panel 120 gradually increases in height as the panel nears the inclinable end of the bassinet 100. The increase in height of the ventilation panel 120 enables adjustment of the panel to the inclined position, while preserving the air flow across the upper surface of the mattress 118. In the elevated condition, the upper surface of the mattress 118 remains below the upper edge of the ventilation panel 120, as seen in FIG. 1A, so that air can pass freely between the interior and the exterior of the bassinet 100 along the upper surface of the mattress 118. In one embodiment, the ventilation panel 120 is configured so that, when the adjustable panel is in the inclined position, the ventilation panel 120 remains about 1 inch above the mattress 118.

**[0024]** The enclosure 110 also can include an outer skirt 124. The outer skirt 124 can be sewn to the side panel 122 and can hang outside the bassinet frame to provide a decorative look to the bassinet 100, as seen in FIGS. 1A-1C.

**[0025]** The floorboard 200 and the adjustable panel 210 of the bassinet 100 can be seen in FIG. 2. The panel 210 can have a length that is less than two thirds, or, more preferably, less than or equal to half, the length of the floorboard 200. The adjustable panel 210 is movably connected to the floorboard 200 to move between the reclined position and the inclined position. The floorboard 200 includes a lower rim area 202 upon which the panel 210 can lie when in the reclined position.

**[0026]** In addition to the floorboard 200, the panel 210, and the enclosure 110, the bassinet 100 also includes a frame 220. The frame 220 is mounted to the floorboard and serves to support the fabric enclosure 110. The frame 220 includes four posts 222 and an upper rail assembly 224. The posts 222

each have first ends mounted to the floorboard 200 and second ends that connect to the upper rail assembly 224 via brackets 226A, 226B, 226C. The upper rail assembly 224 includes a first rail 224A and a second rail 224B connected to the first rail 224A. The first rail 224A can include a bowed shape at either end of the bassinet 100 so that the fabric enclosure 110 can be higher at either end of the bassinet 100 than in the middle. The second rail 224B can be removed from the bassinet 100 to create an access into the interior of the bassinet 100, as shown in FIG. 2A, effectively enabling the bassinet 100 to be pulled alongside a parent's bed in a co-sleeper or bedside sleeper arrangement. The second rail 224B can be removed from the bassinet 100 by lifting one end of the second rail off of bracket 226B and sliding the other end of the second rail out of bracket 226C. The frame 220 further includes a third rail 228 to support the enclosure 110 when the second rail is removed, ensuring that the enclosure 110, when supported by the first rail 224A and the third rail 228, continues to encircle the child sleeping area so that the child will not inadvertently roll out of the bassinet 100. The frame 220 also can include a fourth rail 230, opposite the third rail 228. It will be understood that the rail assembly 224 can have configurations different than shown in FIG. 2.

**[0027]** FIG. 2 shows the adjustable panel 210 in the inclined position. In one embodiment, the panel 210 is designed to have an incline angle of approximately 50 degrees relative to the floorboard 200. In other embodiments, the panel can have a different incline angle or multiple incline angles relative to the floorboard.

**[0028]** As can be seen best in FIGS. 2-4, the floorboard 200 has opposing side edges 200A, 200B, and the panel 210 is movably mounted to the floorboard 200 along an axis that extends between the side edges 200A, 200B. The panel 210 can pivot relative to the floorboard 200 about that axis. The panel 210 is movably connected to the floorboard 200 by a series of hinges 250. FIG. 2B shows a cross section of a hinge 250. That is, the

floorboard includes posts 252 extending between cut-out portions 254' of an edge surface 254 of the floorboard that abuts an opposing edge surface 214 of panel 210. Extending from the edge surface 214 of panel 210 are hinge members 256 that are rotationally coupled the respective posts 252 to enable movement of the panel 210 relative to the floorboard 200. The hinge elements 252, 256 are integrally formed with the floorboard 200 and the panel 210, respectively. The hinge members 256 are flexible thin sections of plastic molded as part of the panel 210.

**[0029]** The panel 210 has a length that is less than two-thirds the length of the floorboard 200, sufficient to elevate the head and abdomen of a child, and, in the illustrated embodiment, the panel 210 is sized so that an axis defined by the hinges 250 bisects the floorboard 200, as shown best in FIGS. 3-4. As an alternative to hinges 250, the panel 210 can be movably connected to the floorboard 200 by any suitable cooperating mechanical hinge(s). As another alternative to hinges 250, the panel 210 can be connected to the floorboard 200 by living hinges, that is, by thinned, bendable pieces of plastic extending between the panel 210 and the floorboard 200.

**[0030]** The panel 210 includes an opening 260 that creates a grip 262 adapted to be gripped by a caregiver to facilitate movement of the panel from the reclined position to the inclined position, as best seen in FIG. 3. To move the panel 210 from the inclined position to the reclined position, the panel 210 includes an actuator, for example, strap 270 that extends through a second opening 272 in the panel 210. The actuator cooperates with at least one adjustment element coupled to the floorboard 200 to move the panel 210 to its reclined position, as will be described in more detail below.

**[0031]** As can be seen from FIG. 1C, the floor 114 of the enclosure 110 includes an opening above the grip opening 260 so that, when the mattress 118 is removed, the caregiver can lift the panel 210 easily. Similarly, the floor 114 includes an opening through which the strap 270 can extend for easy access by a caregiver.

**[0032]** The mechanism that allows adjustment of the panel 210 between the reclined position and the inclined position will now be described in connection with FIGS. 5A-5B and 6A-6C. The panel 210 includes at least one adjustment track and, in the illustrated embodiment, two adjustment tracks 280, as can best be seen in FIGS. 5A and 5B. An adjustment element, which is a bent rod 290 in the illustrated embodiment, is connected to the floorboard 200 and is configured to travel in the adjustment tracks 280 to control positioning of the panel 210 between the reclined position and the inclined position. Each adjustment track 280 has a first end 282 that defines a first position corresponding to the reclined position, a second end 284 that defines a second position corresponding to the inclined position, and a bent travel area 286 therebetween. FIG. 5A shows the rod 290 positioned at the first ends 282 of the adjustment tracks 280; accordingly, the panel 210 is in the reclined position. FIG. 5B shows the rod 290 positioned along the travel areas 286 of the adjustment tracks 280, near the second ends 284; accordingly, the panel 210 is approaching the inclined position.

**[0033]** The rod 290 has a bent shape that includes two arms 292 rotatably fixed to opposite sides of the floorboard 210 by brackets 218, a single arm 294 that rides along tracks 280, and two connecting arms 296 that connect arms 292 to opposite ends of single arm 294. The rod 290 can be a rigid wire, a rigid plastic material, or a combination of the two.

**[0034]** The strap 270 is coupled to the single arm 294 of the rod 290, as shown in FIGS. 5A and 5B. The strap 270 extends through the opening 272 in the panel 210 so that a caregiver can lift up on the strap 270 to move the rod 290 from the second position at the second end 284 of the tracks 280, as shown in FIG. 6A, toward the bend in travel areas 286, as shown in FIG. 6B. At that time, the caregiver can release the strap 270, and the rod 290 can travel along the travel areas 286 to the first ends 284 of the tracks 280, as shown in FIG. 6C, until the panel 210 is flush with the floorboard 200 in the reclined position.

**[0035]** In an alternative embodiment, the rod 290 can be configured to extend across only one half the width of the panel 210, through just one of the tracks 280, yet still support the weight of the panel 210 and a child lying against the panel 210 when the panel 210 is in the inclined position.

**[0036]** The fabric enclosure 110 can be attached to the frame 220 by securing Velcro® straps or cords (not shown) on the enclosure 110 to the floorboard 210 and the upper rail assembly 224. The straps or cords can be passed through slots in the floorboard 210, and straps or cords can be secured around the first and second rails 224A, 224B of the upper rail assembly 224. In addition, elastic loops (not shown) mounted to the exterior of the enclosure 110, about the perimeter of the floor 114, can be secured to hooks 300 on an underside of the floorboard 210. The hooks 300 can be seen in FIGS. 4, 5A, and 6A. An example of how to mount the enclosure 112 to the floorboard 200 and upper rail assembly 224 is described in co-pending application Serial No. \_\_\_\_\_, filed March 25, 2004 in the name of Joshua E. Clapper et al. and entitled BASSINET AND CHANGING TABLE ASSEMBLY, which is incorporated by reference herein in its entirety. The strap 270 can be pulled through the strap opening in floor 114 before mattress 116 is placed on floor 114. Further, as seen in FIG. 1A, the enclosure 110 can include a flap section 130, secured along seam lines 132 to the remaining portions of the enclosure 110 by Velcro®, that can be lowered when the second rail 224B is removed from the first rail 224A.

**[0037]** In an alternative embodiment, in which the fabric enclosure 110 has a sidewall 112 but no floor 114, the enclosure 110 can be attached to the frame 220 only. For example, the enclosure 110 can include inner and outer layers, open at their bottom ends, so that the enclosure can be slid over the upper rail assembly 224 of the frame 220 and secured to the frame 220. The enclosure of this alternative embodiment also could be secured to the floorboard 200, if desired. In addition, in this alternative embodiment, the

mattress 118 can be positioned above and directly on the floorboard 200 and the panel 210.

**[0038]** The bassinet 100 also can include a canopy 400 that can be removably mounted to slots 410 in brackets 1012 mounted to first and second rails 224A, 224B. Further, the bassinet 100 can be mounted to a changing table and/or frame (not shown), as described in co-pending application Serial No. \_\_\_\_\_, filed March 25, 2004 in the name of Joshua E. Clapper et al. and entitled BASSINET AND CHANGING TABLE ASSEMBLY.

**[0039]** In an alternative embodiment of the bassinet, the floorboard 200 could be provided on one side of the bassinet and the panel 210 could be provided on the opposite side of the bassinet, and the two could be connected by a cooperating mechanical hinge. For example, the floorboard 200 and the panel 210 could be mirror images of each other, disposed opposite each other, to form a sleeping surface for a child. In this alternative embodiment, the floorboard and the panel could include frame members, such as U-shaped tubes, about their periphery to which an enclosure could attach so that the enclosure would remain in the same position even when the panel 210 was moved to an inclined position relative to the floorboard 200.

**[0040]** Other ways to achieve an elevated sleeping surface in a bassinet include providing a removable wedge-shaped rigid member that a user can place under the mattress pad, securing a wedge-shaped rigid member directly to the mattress pad, or installing adjustable straps to the bassinet that are suspended from the top rail of the bassinet frame and extend under the mattress pad to support the mattress pad in raised and lowered positions.

**[0041]** Although the figures and the foregoing description primarily focus on one type of child sleeping assembly, namely, a bassinet, it will be understood that other types of child sleeping assemblies, such as cribs and playards, can include a floorboard, an adjustable panel movably connected to the floorboard to move between a reclined position and an inclined position, a frame

mounted to the floorboard, and a fabric enclosure mounted to the floorboard and the frame, wherein the fabric enclosure has a sidewall and floor that defines an enclosed child sleeping area, and the sidewall encircles the child sleeping area. Further, other types of child sleeping assemblies can include a floorboard, an adjustable panel movably connected to the floorboard to move between a reclined position and an inclined position, and an adjustment element connected to the floorboard, wherein the panel includes at least one adjustment track, and the adjustment element is configured to travel in the adjustment track to control positioning of the panel between the reclined position and the inclined position.

**[0042]** The preferred embodiments have been set forth herein for the purpose of illustration. This description, however, should not be deemed to be a limitation on the scope of the invention. Various modifications, adaptations, and alternatives may occur to one skilled in the art without departing from the claimed inventive concept. The true scope and spirit of the invention are indicated by the following claims.